ASSIGNMENT 8

Textbook Assignment: "Basic Hydraulic/Pneumatic and Emergency Power Systems," chapter 7, pages 7-1 through 7-46.

8-1. A system that combines the use of hydraulics and pneumatics is known by what term?

1. Hydroponics
2. Pneumatolytic
3. Pneumatophore
4. Hydropneumatlcs

8-2. Hydraulic flight control system design specifications require what total number of separate systems for operation of the primary flight controls?

1. One
2. Two
3. Three
4. Four

8-3. In an open-center hydraulic system, what type of valve prevents pressure from building up until a demand is placed on the system?

1. A check valve
2. A bypass valve
3. A selector valve
4. A pressure relief valve

8-4. In an open-center hydraulic system, the selector valve automatically returns to the neutral position and to open-center flow when the actuating mechanism reaches the end of its cycle and the system relief valve setting is reached. This is known as what type of selector valve?

1. Manually engaged and pressure disengaged
2. Manually engaged and manually disengaged
3. Pressure engaged and pressure disengaged
4. Pressure engaged and manually disengaged

8-5. A closed-center hydraulic system with a variable displacement pump has what type of valve installed as a backup safety for over pressurization?

1. A check valve
2. A bypass valve
3. A relief valve
4. A selector valve

8-6. What type of hydraulic control valves and actuators operate the primary flight controls?

1. Single acting
2. Double acting
3. Hydropneumatic
4. Tandem construction

IN ANSWERING QUESTIONS 8-7 AND 8-8, REFER TO FIGURE 7-2 IN THE TEXTBOOK.

8-7. The reservoir is pressurized by what force?

1. Ram air
2. Engine bleed air
3. Hydraulic pressure
4. Accumulator preload

8-8. What valve shuts off flow to the secondary systems during flight?

1. The air valve
2. The check valve
3. The snubber valve
4. The isolation valve

8-9. According to military specifications, all hydraulically operated systems considered essential to flight safety or landing must have provisions for emergency actuation.

1. True
2. False

8-10. What component stores the supply of fluid for a hydraulic system?

1. An actuator
2. A reservoir
3. A selector valve
4. A hydraulic motor

8-11. A finger strainer is installed in the filler neck of some nonpressurized reservoirs for what purpose?

1. To trap air that enters the system
2. To clean the fluid as the reservoir is filled
3. To clean the fluid as it leaves the reservoir
4. To serve as a reservoir pressure bypass

8-12. The instruction plate of a reservoir contains all EXCEPT which of the following information?

1. The specification number and color of the fluid to be used
2. The complete instructions for filling the reservoir
3. The frequency the reservoir should be purged
4. The fluid capacity of the reservoir

8-13. There are a total of how many classes of hydraulic reservoirs?

1. One
2. Two
3. Three
4. Four

8-14. The fluid quantity of a nonpressurized reservoir is indicated by a float and arm liquidometer. The liquidometer is operated by what means?

1. Mechanically
2. Electrically
3. Pneumatically
4. Hydraulically

8-15. What is the purpose of a reservoir pressure and vacuum-relief valve?

1. To vent the reservoir to the cabin
2. To maintain 15 psi in the reservoir
3. To allow fluid to flow between the main system reservoirs
4. To maintain a differential pressure range between the reservoir and the cabin

8-16. In an air-pressurized reservoir, the fluid quantity is indicated by what means?

1. The distance the piston rod protrudes from the reservoir end cap
2. The level of fluid shown in the sight gauge
3. The level of fluid in the filter neck
4. The level of fluid on the dip stick

8-17. What is the purpose of a chemical air dryer?

1. To prevent air from entering the system
2. To seal the reservoir at the filler neck
3. To prevent moisture from escaping from the reservoir
4. To absorb moisture that may collect from air entering the system

8-18. Normally, an air pressure regulator maintains what amount of pressure in the reservoir?

1. 10 psi
2. 15 psi
3. 40 psi
4. 90 psi

8-19. An air-relief valve is usually incorporated in the air portion of a hydraulic power system to relieve excessive air pressure that may enter the system from what malfunctioning component?

1. A check valve
2. A filler valve
3. A chemical air dryer
4. An air pressure regulator

8-20. To allow pressurized air from the reservoir to flow through the air bleeder valve to an overboard vent, you should take what action?

1. Depress the push button
2. Release the push button
3. Turn the hex nut clockwise
4. Turn the hex nut counterclockwise

8-21. A fluid-pressurized reservoir is divided into two chambers by what device?

1. A pressure probe
2. A vertical baffle
3. A floating piston
4. A horizontal diaphragm

8-22. For the operation of actuating units in an emergency, what type of pump is generally installed?

1. A motor-driven pump
2. A double-action pump
3. An engine-driven pump
4. A single-action hand pump

8-23. What type of hand pumps is used in naval aircraft hydraulic systems?

1. Single-action
2. Simple-stroke
3. Double-action
4. Compound-stroke

IN ANSWERING QUESTION 8-24, REFER TO FIGURE 7-13 IN THE TEXTBOOK.

8-24. What action takes place when the piston in the pump is moved to the right?

1. Check valve A opens; check valve B closes; fluid enters port C
2. Check valve A closes; check valve B opens; fluid exits port D
3. Check valve A opens; check valve B closes; fluid exits port D
4. Check valve A closes; check valve B closes; fluid exits port D

8-25. When air is in the emergency hydraulic system and the handle of the hand pump is moved to the right, what handle reaction, if any, will occur?

1. It will creep slowly to the left only
2. It will creep slowly to the left and then spring rapidly to the right
3. It will spring rapidly to the left
4. None

8-26. A pump that delivers 3 gallons of fluid per minute at a speed of 2,800 rpm, and continues to deliver at that rate regardless of the pressure in the system, is known as what type of pump?

1. A variable displacement pump
2. A constant displacement pump
3. A rotary action pump
4. A gear-type pump

8-27. The use of a variable displacement pump in a hydraulic system eliminates the need for what component?

1. A reservoir
2. An accumulator
3. A hydraulic fuse
4. A pressure regulator

8-28. Gear-type pumps are usually driven by what means?

1. A dc electric motor
2. An ac electric motor
3. An aircraft engine
4. A servo unit

8-29. A piston-type (constant displacement) pump sucks fluid into one port and forces it out the other port. This is known as what type of piston motion?

1. Axial
2. Rotary
3. Reciprocating
4. Counterrotating

8-30. To change the rotation of a piston-type (constant displacement) pump, you must perform which of the following functions?

1. Reverse the drive gears
2. Reverse the universal link
3. Rotate the valve plate 90 degrees
4. Rotate the valve plate 180 degrees

8-31. The internal parts of a Stratopower (variable displacement) pump perform what four major functions?

1. Hydraulic drive, flow control, pressure regulation, and bypass
2. Pressure control, mechanical drive, bypass, and fluid displacement
3. Bypass, pressure regulation, fluid displacement, and hydraulic drive
4. Pressure control, flow control, mechanical drive, and pressure regulation

8-32. A Stratopower pump has creep plates installed for what purpose?

1. To increase the angle of the drive cam
2. To decrease wear on the revolving cam
3. To provide a support for the stationary bearing
4. To ensure proper alignment of the nutation plate

8-33. During operation of a Stratopower pump in a nonflow condition, lubrication is provided by what means?

1. A bypass system
2. A bypass piston
3. A compensator piston
4. A compensator spring

8-34. To provide a positive fluid pressure at the suction port, what type of boost pump is incorporated into the Vickers electric, motor-driven, variable displacement pump?

1. A centrifugal boost pump
2. A Stratopower boost pump
3. A ramp-type boost pump
4. A turbo boost pump

8-35. As system pressure drops, the Vickers electric, motor-driven pump will provide what maximum flow rate?

1. 6 gpm at 2,900 psi
2. 8 gpm at 2,200 psi
3. 8 gpm at 3,000 psi
4. 9 gpm at 3,100 psi

8-36. During an inspection you find metal slivers on the gearbox magnetic drain plug of a Vickers electric, motor-driven pump. What action should you take?

1. Replace the gearbox
2. Replace the magnetic plug
3. Drain and service the pump
4. Remove the pump for overhaul

8-37. Relief valves are installed in aircraft hydraulic systems for what purpose?

1. To aid in control stick movement
2. To prevent shock strut overpressurization
3. To protect the system from excessive fluid pressurization
4. To direct the flow of fluid from the pump to the actuators

8-38. To increase the opening pressure of a thermal relief valve, what action must you take?

1. Turn the adjusting screw clockwise
2. Turn the adjusting screw counterclockwise
3. Replace the poppet spring and ball with a larger one
4. Replace the poppet spring and ball with a smaller one

8-39. A shutoff valve is used for all EXCEPT which of the following purposes?

1. To control the flow of fluid
2. To relieve excessive pressure
3. To control the speed a component moves
4. To help isolate trouble by shutting off systems or subsystems

8-40. An electric solenoid shutoff valve is also referred to as what type of valve?

1. A priority valve
2. A sequential valve
3. A compensator valve
4. An electrocontrol valve

8-41. You can stop the flow of fluid in a needle-type, manual shutoff valve by which of the following means?

1. Pulling the lever
2. Pushing the lever
3. Turning the handle in a clockwise direction
4. Turning the handle in a counterclockwise direction

8-42. What is the maximum allowable temperature for any type of military aircraft hydraulic system?

1. 100°F
2. 200°F
3. 300°F
4. 400°F

8-43. A radiator-type hydraulic fluid cooler uses what medium for cooling?

1. Engine oil
2. Engine fuel
3. Ambient air
4. Electric blower

8-44. What component is used to conserve space and provide a means where common fluid lines may come together?

1. A venturi
2. A network
3. A manifold
4. A control center

8-45. What three basic units make up a filter assembly?

1. Filter element, bowl, and poppet
2. Bowl, head assembly, and filter element
3. Head assembly, bypass valve, and filter element
4. Differential pressure indicator, bowl, and filter element

8-46. What type of noncleanable filter element is used on most naval aircraft?

1. 5-micron (absolute)
2. 3-micron (absolute)
3. 3-micron
4. 5-micron

8-47. The differential pressure indicator on a filter assembly is reset by what means once the button is extended?

1. Pneumatically
2. Hydraulically
3. Electrically
4. Manually

8-48. To prevent fluid loss when the bowl has been removed, most filter assemblies incorporate what item in the head?

1. A check valve
2. A cover plate
3. A quick disconnect
4. An automatic shutoff valve

8-49. Prior to the installation of a cleaned filter bowl, the bowl should be filled with new filtered hydraulic fluid from an authorized servicing unit.

1. True
2. False

8-50. What type of accumulator is most commonly used in high-pressure hydraulic systems?

1. The ball type
2. The diaphragm type
3. The spherical type
4. The cylindrical type

8-51. Which of the following components is/are NOT a part of a cylindrical type accumulator?

1. Rubber diaphragm
2. Piston assembly
3. Cylinder
4. End caps

8-52. You can preload an accumulator by using which of the following procedures?

1. Pressurizing the fluid chamber with compressed air
2. Filling the fluid chamber with a prescribed amount of fluid
3. Inflating the air chamber to a predetermined pressure below the system operating pressure
4. Inflating the air chamber to a predetermined pressure above the system operating pressure

8-53. Most naval aircraft are equipped with air pressure gauges to read the preload of an accumulator after relieving hydraulic system pressure.

1. True
2. False

8-54. To indicate the amount of pressure in a hydraulic system, naval aircraft use what two types of pressure gauges?

1. Synchro and electric
2. Direct-reading and synchro
3. Direct-reading and Bourdon
4. Direct-reading and indirect-reading

8-55. The Bourdon tube in a direct-reading pressure gauge is operated by what means?

1. Spring action
2. Fluid pressure
3. Electrical current
4. Mechanical linkage

8-56. A synchro-type pressure indicator transmits what type of signal from the synchro to the indicator?

1. Pneumatic
2. Hydraulic
3. Mechanical
4. Electrical

8-57. To prevent damage to gauges and pressure transmitters, hydraulic systems use what component?

1. Pressure regulators
2. Restrictor valves
3. Snubbers
4. Buffers

8-58. An aircraft emergency power system pump can be powered by which of the following methods?

1. A hand pump
2. A ram-air turbine
3. An electric motor
4. Each of the above

8-59. The pressure switch of an electric, motor-driven, emergency power system is actuated by what means?

1. Manually, by the pilot
2. Mechanically, by the pump motor
3. Automatically, by hydraulic pressure
4. Electrically, by the emergency switch

8-60. The ram-air turbine assembly of an emergency power system is extended into the slipstream (a) by what means and (b) during what condition?

1. (a) Automatically
   (b) when a hydraulic failure occurs
2. (a) Automatically
   (b) when an engine failure occurs
3. (a) Manually
   (b) when released from the cockpit
4. (a) Electronically
   (b) when released-from the cockpit

8-61. Extension of the ram-air turbine assembly is initiated by what force acting on the turbine actuator?

1. Gravity
2. Airstream
3. Spring loaded
4. Hydraulic pressure

8-62. The air compressor in an aircraft pneumatic system is supplied air from what source?

1. An electric-driven fan
2. The aircraft engine
3. A ram-air turbine
4. The ambient air

8-63. The air compressor in an aircraft pneumatic system is operated by what means?

1. A mechanical motor
2. An electric motor only
3. A hydraulic motor only
4. An electric or hydraulic motor

8-64. In an aircraft pneumatic system, the moisture separator is always in which of the following locations?

1. Downstream of the compressor
2. Downstream of the reservoir
3. Upstream of the compressor
4. Upstream of the reservoir

8-65. A chemical air drier cartridge is NOT contaminated when it is what color?

1. Red
2. Blue
3. Pink
4. White

8-66. Pneumatic storage cylinders are used in aircraft pneumatic systems for which of the following purposes?

1. To store air only
2. To serve as a moisture trap only
3. To store air and serve as a moisture trap
4. To serve as a pneumatic shutoff valve while in flight

8-67. If the instruction plate is missing from an air storage cylinder, you can find servicing information in which of the following publications?

1. IPB
2. MIM
3. MRC
4. NATOPS